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THE MAMMALS OF MANITOBA.

Life-histories of Northern Animals: an Account of the Mammals of Manitoba. By Ernest Thompson Seton. Vol. i., Grass-Eaters. Pp. xxx+673. Vol. ii., Flesh-Eaters. Pp. xii+674–1267. (London: Constable and Co., Ltd., 1910.) Price £3 13*s.* 6*d.* net.

SO far as this country is concerned, it is a great pity that Mr. Seton did not include in his admirable life-histories the whole mammalian fauna of North America, as the restriction of the species to those inhabiting a particular area can scarcely fail to be faulty in the eyes of English readers, who will miss such well-known animals as the big-horn sheep, white goat, Columbian black-tailed deer, and the brown bears and caribou of Alaska. It is likewise a matter for regret that the whole of the table of contents is included in the first volume, instead of the portion relating to the Carnivora being reserved for the second. Except this very small modicum of fault-finding, I have nothing but commendation to bestow on these handsome volumes, which, it may be presumed, are an English edition of the work issued last year in America under the same title.

The mammals of Manitoba are fifty-nine in number, and of these the author describes the life-history in his own inimitable manner, and with a wealth of detail that leaves little, if anything, for future field naturalists to record. The great feature of the work is, of course, that it is the result of personal observation and first-hand knowledge, acquired during wanderings extending over a long series of years, and embracing a very large portion of the North American continent. The map of his travels shows, in fact, that Mr. Seton has explored the whole of the United States, from ocean to ocean, so that the red lines which mark his route form a perfect network. Southward he has touched the Mexican border, while northward he has visited Labrador on the east, and on the west has made a single traverse to the heart of the Mackenzie district. And it is these extensive journeys, with the knowledge thereby acquired, that intensifies our regret that he did not see fit to make his work cover the whole North American mammal fauna. In spite of the almost omniscient character of his personal knowledge of the habits and distribution of the animals of which he writes, the author has been at the pains to quote the names of observers by whom special traits were first recorded.

In addition to his well-known power of conveying important scientific information in most attractive and popular language, Mr. Seton enjoys the great advantage of being a skilled artist, so that he is able to present to his readers portraits of the animals in the particular pose which he considers most characteristic and interesting. The amount of labour he has expended on artistic work may be inferred from the fact that the whole of the 560 illustrations were drawn with his own pencil. Such sketches are, in my opinion, infinitely superior to photographs, which too frequently do not bring out the characteristic features which the describer desires to emphasise. That many of these illustrations, if I mistake not, have appeared in other publications, testifies to public appreciation of their artistic merit.

In the space at my disposal it is quite impossible to attempt anything in the way of a critical review of these two bulky quarto volumes, and I shall therefore content myself with noticing some of the author's observations relating to the larger species which appear of special interest.

By far the most characteristic American type of big game is undoubtedly the prongbuck, a species the distributional area of which has been reduced by about one-half, and the numbers of which were estimated by the author in 1900 not to exceed, at most, 100,000, of which half must be in Mexico. And yet from the accounts of travellers of no earlier date than 1868 it seems probable that these graceful antelopes, as they are locally called, actually outnumbered the bison in the days of its prime. Taking the number observed in one particular district as a basis, the author calculates that, on a low estimate, there must have been over 40 millions on the great plains. Since 1900 these antelopes, in spite of reported local increases, have probably suffered a further serious decrease, the number in Wyoming in 1905 being estimated at not more than one-fourth of what it was five years previously.

As regards the extermination of the bison, Mr. Seton, although as a naturalist regretting the event, takes what may be called the practical view of the subject, and declares it to have been absolutely inevitable. The plains were required by the advance of civilisation, and the supporting of vast herds of stupid bison, ready to stampede in an overwhelming mass on the slightest alarm, was not the best use to which they could be put. On the testimony of two independent observers, he asserts that blizzards, especially those of 1871–2 and 1880–1, had a share in the extermination of the bison, one of the two witnesses stating that the Dakota blizzard was more destructive to the herds than the Indians. Since, however, blizzards are only occasional events, Mr. Seton doubts if their destructiveness was equal to that of agencies working with greater regularity.

In concluding this brief notice of a first-class work, it may be noted that the author is a firm believer in the evolution of the mind of man from that of animals below him in the zoological scale.

R. L.

THE CARE OF TREES.

The Care of Trees in Lawn, Street, and Park. By Bernard E. Fernow. Pp. x+392. (New York: Henry Holt and Co., 1910.)

ALTHOUGH there is scarcely a garden or park of any pretensions in this country which does not contain within its boundaries one or more trees particularly valued for their interest, beauty, or associations, how rarely do their owners ever take any steps to keep them in health, and thus prolong their term of years. The care of trees, indeed, more

especially those parts in it which may be described as surgical and antiseptic, is an art strangely recent in origin. Some of the practices of still living "tree-doctors" (one may instance the leaving of a stump "to draw the sap" when a branch or limb is sawn off) betray a simple faith curiously reminiscent of the methods of sixteenth-century practitioners on the human frame.

But owners of trees are, on the whole, content to let them run their ordinary course, although nothing is more certain than that by judicious treatment the span of years of many trees may be extended by tens, perhaps hundreds, of years. The value, of course, of many such trees is a purely sentimental one. Yet among individual living things trees seem to link the centuries together more effectually than anything else. What heart is not moved by the sight, and still more by the possession, of a tree under which it is known some famous man of old, or even one's own forbears, sat and mused.

The author of this work is well known to those in his own walk in life, as one of the most eminent and trustworthy authorities on the subject in the United States and Canada. And we may say at once that this book fully bears out his reputation. It is a pleasant change, after wading through much of the ignorant twaddle that is nowadays so plentifully offered to the tree-loving public, to come across a book the author of which has (what, indeed, the unsophisticated might regard as essential) an adequate knowledge of his subject.

Mr. Fernow's object is, briefly, to interest his readers in their trees, to give them some idea of how they grow and do their work, and to give directions for their cultivation and preservation. Much of what he writes is more particularly applicable to the north-eastern United States and the adjacent parts of Canada, where the climatic conditions, especially in relation to tree and shrub growth, are sufficiently dissimilar to our own as to render some modification of his recommendations necessary before they can be adopted here. But his treatise, on the whole, is very well worth study by those interested in the trees and shrubs of English parks and gardens.

We regret that the author thought it necessary to give a sort of recommendation—although certainly a half-hearted one—to the book on pruning written by A. des Cars, nearly fifty years ago. Des Cars' system of pruning is hopelessly discredited by now. As applied to trees grown solely for timber it was out of the question for reasons of cost, and as applied to the purely ornamental trees of gardens, the rigid formality he advocated was absolutelv at variance with the tastes of ninety-nine people out of a hundred.

The latter part of this book is taken up with the description of trees and with the consideration of their respective value and treatment. It is somewhat cursorily done, and is the least satisfactory part, in that it is far from free of errors. The horse chestnut, for instance, is not Chinese (p. 250), nor is *Prunus pissardii* Japanese (p. 304). The author has sadly confused the *Pyrus sinensis* of Lindley, a true pear, with the common *Cydonia japonica*, which is, of course, a quince (p. 297). It is a remarkable lapse to recommend rhododendrons for calcareous soils, which, with the exception of one or two species, they abhor (p. 372). The list of "shrubs fit for rock gardens" is strangely inadequate (p. 373). About a dozen plants are mentioned, half of which are absolutely unfitted for any ordinary rock garden, whilst the scores of dainty shrubs, mainly alpine, the neatness of habit and slow growth of which render them peculiarly fitted for such a position are quite ignored. Errors in spelling, too, are numerous.

In view of the thoughtless and ignorant outcry which is usually set up in the daily Press whenever the removal or thinning, or even lopping, of trees in public places is done, it was a happy thought to quote a letter written by J. R. Lowell to the president of Harvard University in 1863. The following words will bear repeating:—

"Something ought to be done about the trees in the college yard. They remind me always of a young author's first volume of poems; there are too many of 'em and too many of one kind. If they were not planted in such formal rows, they would typify very well John Bull's notion of 'our democracy,' where every tree is its neighbour's enemy, and all turn out scrubs in the end, because none can develop fairly. . . . We want to learn that one fine tree is worth more than any mob of second-rate ones. Do pray take this matter into your own hands—for you know how to love a tree—and give us a modern instance of a wise saw."

THE MAKING OF BEET-SUGAR.

Beet Sugar Making and its Chemical Control. By Y. Nikaido. Pp. xii+354. (Easton, Pa.: The Chemical Publishing Co.; London: Williams and Norgate, Ltd., 1909.) Price 12*s.* 6*d.* net.

THE aim of this work, the author remarks, is to aid those who are starting on a career of beet-sugar manufacture, but who lack systematic training in the technique thereof.

In principle, the production of sugar from beetroots is a simple matter. The sugar and other soluble bodies are extracted from the sliced roots by diffusion in water; the juice thus obtained is purified from acids and other objectionable matter by "defecation" with lime, and after the excess of lime has been removed by treatment with carbonic acid, the liquor is concentrated by evaporation until the sugar crystallises out. Whilst, however, there is nothing complicated about the principle, successful and profitable production depends upon close attention to a number of points in respect of which the chemist's help is needed.

These points Mr. Nikaido describes and explains at length. The essential part of the book is contained in one chapter—the eighth. This is devoted to expounding the "practical operation," *i.e.* management, "of a beet-sugar house." It sets forth the various steps involved, from harvesting the beets to packing the sugar, and gives details of the chemical examinations necessary for the proper control of the processes. The descriptions bear the stamp of practicality, and the value of the book in actual work is enhanced by a series of useful tables. In the last